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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,235	08/08/2001	David Allen Langan	RD-28512	9891

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EXAMINER	
TUCKER, WESLEY J	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/682,235	Applicant(s) LANGAN ET AL.	
	Examiner Wes Tucker	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12* is/are allowed.

6)☒ Claim(s) *1,2,13,14,24,25,27 and 28* is/are rejected.

7)☒ Claim(s) *1-37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 September 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 1-37 are objected to because of the following informalities: The text of the claims should begin with "what is claimed is..." or something of equivalent effect and the claims are numbered with bracketed numbers such as "[c1]". This is not in accordance with the typical numbering of claims. Claims are conventionally labeled with numbers such as "1." without brackets. Conventional indention is also requested. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 13, 14, 24, 25, 27, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,546,124 to Hopple et al.

With regard to claim 1, Hopple discloses a method for compressing an intensity dynamic range of an input image to a reduced intensity dynamic range of an image display device, said method comprising:

defining a plurality of units of the input image (column 1, lines 58-61 and column 6, lines 15-17);

determining a local mean estimate of an intensity of each of the plurality of units of the input image (column 1, lines 58-61 and column 6, lines 15-17);

generating a contrast modification processing value for each local mean estimate (column 6, lines 17-27); and

generating an output intensity value, for each local mean estimate, by using only the generated contrast modification processing value and an input intensity value (column 6, lines 47-51).

The contrast modification value is interpreted as the boost value determined from the look-up tables and the local mean intensity value. The output intensity value is interpreted as the signal left after the boost output is processed with the input signal.

With regard to claim 2, Hopple discloses a method in accordance with Claim 1 wherein defining a plurality of units comprises:

defining a plurality of units such that each unit corresponds to a pixel of the input image as detected by an image detector (column 1, lines 58-61 and column 6, lines 15-17); and

defining a plurality of units such that each unit corresponds to an input intensity value that is at least one of a square-root encoded input intensity value and a linear encoded input intensity value (column 10, lines 46-51).

With regard to claim 13, the discussion of claim 1 applies. Hopple discloses an apparatus for performing the method of claim 1 (Fig. 2).

With regard to claim 14, the discussion of claim 2 applies.

With regard to claim 24, the discussion of claim 1 applies. It is understood that Hopple discloses a computer readable medium for performing the method of claim 1 (Fig. 2, element 10).

With regard to claim 25, the discussion of claim 2 applies.

With regard to claim 27, Hopple discloses a computer readable medium in accordance with Claim 24 wherein to generate a combiner input value, said program further configured to multiply the generated contrast modification processing value by an input intensity value (column 6, lines 17-27 and 47-51).

The contrast modification value is interpreted as the boost value determined from the look-up tables and the local mean intensity value. The output intensity value is interpreted as the signal left after the boost output is processed with the input signal. The lookup table is used to output a value that is applied to the local mean intensity value to obtain a boost value, which is a percentage and considered to be a multiplier.

With regard to claim 28, Hopple discloses a computer readable medium in accordance with Claim 24 wherein to generate an extractor output value such that the number of bits of the extractor output value correspond to a predetermined number of bits required by the image display device said computer further configured to process the combiner input value with a bit extractor/combiner (column 2, lines 38-44). The contrast is compressed to 256 levels represented by 8 bits.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U:S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,546,124 to Hopple et al. and U.S. Patent 6,711,302 to Lee.

With regard to claim 35, hopple discloses A method for compressing an intensity dynamic range of an input image to a reduced intensity dynamic range of an image display device, said method comprising:

defining a plurality of units of the input image (column 1, lines 58-61 and column 6, lines 15-17);

determining a local mean estimate of an intensity of each of the plurality of units of the input image (column 1, lines 58-61 and column 6, lines 15-17);

generating a contrast modification processing value for each local mean estimate (column 6, lines 17-27), and

generating an output intensity value, for each local mean estimate, by using the generated contrast modification processing value and an input intensity value (column 6, lines 47-51).

The contrast modification value is interpreted as the boost value determined from the look-up tables and the local mean intensity value. The output intensity value is interpreted as the signal left after the boost output is processed with the input signal.

Hopple does not disclose using a morphological filter to determine a local mean estimate. However it is well known in the art to use morphological filters to determine characteristics of local pixel neighborhoods. Lee teaches the use of a morphological filter to determine weighted average of a pixel neighborhood and changing the filter in order to best determine the average as needed (column 7, lines 47-57). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use a morphological filter as taught by Lee to determine the local average of a neighborhood of pixels for use in the method of Hopple in order to best determine the average of the pixel neighborhood.

With regard to claim 36, Hopple discloses a method according to Claim 35 wherein generating an output intensity value comprises generating an output intensity value, for each local mean estimate, by using only the generated contrast modification processing value and an input intensity value (column 6, lines 47-51). The generated contrast modification value is interpreted as the BOOST or GAMMA component as they are applied to the input intensity value to compress the range.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,546,124 to Hopple in view of U.S. Patent 6,370,265 to Bell et al.

With regard to claim 37, Hopple discloses a method for compressing an intensity dynamic range of an input image to a reduced intensity dynamic range of an image display device, said method comprising:

defining a plurality of units of the input image (column 1, lines 58-61 and column 6, lines 15-17);

determining a local mean estimate of an intensity of each of the plurality of units of the input image (column 1, lines 58-61 and column 6, lines 15-17);

generating a contrast gain value for each local mean estimate using a look-up table, and generating an output intensity value, for each local mean estimate, by using the generated contrast gain value and an input intensity value (column 6, lines 47-51).

Hopple does not disclose expressly a sigmoid look-up table. Bell teaches the use of a sigmoid function for determining a look-up table representing a continuous curve and having the desired contrast and brightness (column 2, lines 48-64). Sigmoid look-up tables such as the one taught by Bell have been found to represent desired brightness for converting a contrast scale. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use a look-up table determined by a sigmoid function as taught by Bell in use with the contrast range conversion of Hopple to convert image values to have desired contrast and brightness.

Allowable Subject Matter

Claim 12 is allowed.

Claims 3-11, 15-23, 26, and 29-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: With regard to claims 3, 6, 12, 15, 18, 26, and 29, all of these claims contain the feature of obtaining a second value by dividing the first obtained value by the local mean estimate. Hopple does not teach or reasonably suggest the calculation of this second value. None of the prior art describes calculating a first value in the detail claimed in the present invention and it would therefore be unreasonable to combine another reference with Hopple to read on the calculating of the second value since the second value relies on the first value calculated by Hopple. All of the remaining claims objected to as being allowable depend from these claims which claim the calculation of a second value and are therefore allowable for the same reasons.

Prior Art

Other Prior Art considered relevant but not relied upon is as follows:

U.S. Patent 5,357,549 to Maack et al. discloses an x-ray image range compression method.

U.S. Patent 6,141,399 to Tsujii discloses a range compression for an image using look-up tables and contrast enhancement.

U.S. Patent 5,588,071 to Schultz discloses a method for enhancing the grey scale in an area of interest in medical x-ray images.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 703-305-6700. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wes Tucker

6-22-04

Jon Chang
Primary Examiner